IEE PROCEEDINGS

Science, Measurement and Technology

Vol. 147, 2000

Published by
The IEE, Savoy Place, London WC2R 0BL, United Kingdom
Publishing Department: Michael Faraday House, Six Hills Way, Stevenage, Herts. SG1 2AY, United Kingdom

IEE Proceedings

SCIENCE, MEASUREMENT AND TECHNOLOGY

The Institution of Electrical Engineers, Savoy Place, London WC2R 0BL, United Kingdom
Publishing Department: Michael Faraday House, Six Hills Way, Stevenage, Herts. SG1 2AY, United Kingdom

Volume 147 2000 UK ISSN 1350–2344

HONORARY EDITORS

Dr. G.W. Chantry (*International Technology Transfer Consultant*)
Dr. M.J. Cunningham (*University of Manchester*)

Pages in issues of *IEE Proc.-Sci. Meas. Technol.*, 2000

Pages	Issue No.	Date
1–40	1	January
41–96	2	March
97–152	3	May
153–212	4	July
213–268	5	September
269–420	6	November

This publication is copyright under the Berne Convention and the Universal Copyright Convention. All rights reserved. Apart from any copying under the UK Copyright, Designs and Patents Act 1988, Part 1, Section 38, whereby a single copy of this article may be supplied, under certain conditions, for the purposes of research or private study, by a library of a class prescribed by The Copyright (Librarians and Archivists) (Copying of Copyright Material) Regulations 1989: SI 1989/1212, no part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means without the prior permission of the copyright owners. Permission is, however, not required to copy abstracts of individual contributions on condition that a full reference to the source is shown.

Authorisation to photocopy items for internal or personal use, or for the internal or personal use of specific clients, is granted by the Institution of Electrical Engineers for libraries and other users registered with the Copyright Clearance Center Transactional Reporting Service, provided that the base fee of $20.00 per copy is paid directly to the Copyright Clearance Center, Inc., 222, Rosewood Drive, Danvers, MA 01923, USA (1350–2344/00 $20.00). This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale.

The IEE is not as a body responsible for the opinions expressed by individual authors.
The IEE is a member of the Association of Learned & Professional Society Publishers.

© 2000: The Institution of Electrical Engineers

Chief Executive of the IEE: Alf Roberts BSc PhD CEng FIEE FInstP
Managing Editor: Gill Wheeler

Printed by: Black Bear Press Limited, Cambridge, United Kingdom

Index

IEE Proceedings
Science, Measurement and Technology

Vol. 147, 2000

Author Index

A

Ajiki, H. p131
Alford, C. p333
Alford, N.McN. p269
Ali, M. p86, p110, p115, p285
Allen, J. p403
Allen, N.L. p243, p291
Allen, T. p321
Andreyev, A.M. p95
Armstrong, K. p183
Arora, R. p7
Arus, C. p309
Attikiouzel, Y. p408
Awan, S.A. p193

B

Balachandran, W. p165
Barclay, I. p41
Beadle, P.J. p374
Beeby, S.P. p127
Benassi, A. p327
Benitez, D.S. p397
Benson, T.N. p279
Bigan, C. p368
Black, A.M.S. p339
Bodger, P.S. p141
Bohacek, J. p190
Bolton, H.R. p237
Breeze, J. p269
Brewitt-Taylor, C. p209
Britton, J. p382

C

Cahill, L.W. p414
Calderwood, J.H. p27
Caleb, P. p339
Carpenter, D.J. p266
Carson, E.R. p389
Cecelja, F. p165
Chan, F.H.Y. p374
Chandrasekhar, R. p408
Chen, G. p296
Chen, J.D.Z. p351
Christopoulos, N. p279
Clarke, K.K. p186
Cooper, J. p97
Cornick, K.J. p249
Crosley, P.A. p249

D

Dalley, A. p153
Danikas, M.G. p95
Dann, Z. p41
Daponte, P. p34
Davies, A.E. p2, p296
Derrah, S. p169
Desmulliez, M.P.Y. p261
Dhariwal, R.S. p261
Dinnis, A.K. p279
Dolan, J.E. p237
Dong, G. p414
Dow, C.S. p158
Drummond, G.B. p339

E

El-Deredy, W. p309
El-Khafif, S. p389
Emsley, A.M. p86, p110, p115, p285
Evans, J.C. p243
Everson, R. p333

F

Fernandes, R. p219
Findlay, R.D. p169
Fitchet, A. p397
Fitzpatrick, A.P. p397
Fu, M. p296

G

Gardner, J.W. p158
Gaydecki, P.A. p397
Georghiou, G.E. p65
Gibson, J.R. p274
Goh, K.B. p357
Grattan, K.T.V. p389
Greaves, D.A. p291
Grimaldi, D. p34
Grunewald, R.A. p382

H

Hama, S. p121
Hankui, E. p131
Harris, P. p309
Hartland, A. p174
Hassan, A.K. p137, p153
Henderson, G.T. p321
Henderson, L.C.A. p173
Hepburn, D.M. p97
Heywood, R.J. p86, p110, p115, p285
Hines, E.L. p158
Hodgson, S.N.B. p301
Hofton, M. p153
Hu, X. p81
Huang, Y.. p309
Hudson, R. p321

I

Ifeachor, E.C. p321

J

James, C. p315
Jancewicz, B. p19
Janssen, T.J.B.M. p174
Jervis, B.W. p382
Jevic, M. p95
Johnstone, P.T. p141
Jones, N.B. p357

K

Kaneko, A. p121
Kemp, I.J. p97, p105, p256
Kibble, B.P. p193
Kiuchi, H. p121
Kondo, T. p121
Kong, M.G. p279
Koyama, Y. p121
Kuang, W.T. p213
Kumar, U. p56

L

Lam, N.S.K. p291
Landini, L. p327
Lapovok, A.J. p145
Lederer, P. p209
Lee, Y.Y.B. p309
Lewin, P.L. p2
Lim, C.L. p357
Lin, C.-H. p229
Lindell, I.V. p19
Lisboa, P.J.G. p309
Llobet, E. p158
Lowe, D. p315
Lu, Y. p81

M

Mammoliti, R. p327
Mayhew, J.E.W. p219
McAllister, H.G. p378
McCullagh, P.J. p378
McQuillin, B.M. p301
Metaxas, A.C. p65
Michaeli, L. p34
Morgan, C. p389
Morgan, V.T. p169
Morris, A.S. p213
Morrow, R. p65
Murgatroyd, P.N. p15, p266
Murray, A. p403

N

Nabok, A.V. p137, p153
Nagabhushana, G.R. p56
Nagasawa, C. p131

P

Panigrahi, S. p137
Parikh, C.R. p357
Patel, D. p296
Penn, S.J. p269
Pont, M.J. p357
Poole, M. p269
Positano, V. p327
Power, O. p183

R

Rahman, M.K.A. p7
Ray, A.K. p137, p153, p301
Reymann, D. p177
Rezek, I. p333, p345
Roberts, S. p333
Roberts, S.J. p345, p363
Robinson, I.A. p193
Rodriguez, M. p196

S

Saatchi, M.R. p219
Sabry-Rizk, M. p389
Santarelli, M.F. p327
Shen, M. p374
Shields, A.J. p97, p105, p256
Shin, H.W. p158
Sloan, R. p91
Spencer, A.J. p15
Sprevak, D. p378
Spurgeon, S.K. p357
Srigengan, B. p274
Srivastava, S.C. p7
Steuer, M. p339
Stone, H. p333
Stuttle, M. p127
Sun, L. p374
Sutton, S.J. p2, p296
Sykacek, P. p345

T

Takahashi, Y. p121
Tan, X. p81
Taylor, S. p274
Torres, J.-M. p261
Tracey, S.M. p301
Travis, J. p153
Tsao, T.-P. p229
Twiddle, J.A. p357

V

Vigon, L. p219
Vishnevsky, A.M. p145

W

Wakaumi, H. p131
Walsh, J.E. p183
Wang, X. p2
Wang, Z.D. p249
Wang, Z.S. p351
White, N.M. p127
Wilson, S. p333
Wimalaratna, H.S.K. p321
Witt, T.J. p177
Woolfson, W.S. p368

X

Xiao, X. p110, p115, p285

Y

Ye, H. p414
Youngs, I.J. p202

Z

Zaidi, A. p397
Zebboudj, Z. p74
Zgallai, W. p389
Zhu, D.H. p249
Zhuravleva, N.M. p95
Zinieris, M. p91

ACOUSTICS AND ULTRASONICS

Accurate measurement of currents generated by single electrons transported in a one-dimensional channel p174
Combined time-of-flight and Doppler ultrasonic tracking system for better performance in robot tracking p213
Nonlinear analysis of carotid artery echographic images p327

ARTIFICIAL INTELLIGENCE

Classification of the strain and growth phase of cyanobacteria in potable water using an electronic nose system p158

BIOMEDICAL ENGINEERING

Adaptive combination of linear predictors for lossless image compression p414
Aspects of diagnostic schemes for biomedical and engineering systems [EMG, ECG, and diesel engine application] p357
Automated assessment of vigilance using committees of radial basis function analysers p333
Classification of the strain and growth phase of cyanobacteria in potable water using an electronic nose system p158
Effect of cross-correlation on auditory evoked response detection p378
Extracting single trial event related potentials p382
Extreme value statistics for novelty detection in biomedical data processing p363
Learning interaction dynamics with coupled hidden Markov models p345
New range-based neighbourhood operator for extracting edge and texture information from mammograms for subsequent image segmentation and analysis p408
Nonlinear analysis of carotid artery echographic images p327
Novel decision strategy for P-wave detection utilising nonlinearly synthesised ECG components and their enhanced pseudospectral resonances p389
Parametric bispectral estimation of EEG signals in different functional states of the brain p374
Prospects for routine detection of dementia using the fractal dimension of the human electroencephalogram p321
Quantitative evaluation of techniques for ocular artefact filtering of EEG waveforms p219
Robust ECG R-R wave detection using evolutionary-programming-based fuzzy inference system (EPFIS), and application to assessing brain-gut interaction p351
Robust methodology for the discrimination of brain tumours from in vivo magnetic resonance spectra p309
Time-frequency analysis of short segments of biomedical data p368
Using dynamical embedding to isolate seizure components in the ictal EEG p315
Variability of photoplethysmography peripheral pulse measurements at the ears, thumbs and toes p403
Virtual instrumentation for clinical assessment of cardiovascular and autonomic function p397
Visualisation and categorisation of respiratory mechanism using self organising maps p339

CABLES AND OVERHEAD LINES

Coaxial conductor of high screening capability p27
Method to determine the trapping level of a polymeric material from thermally stimulated discharge current measurements p2
New formula to calculate the skin effect in isolated tubular conductors at low frequencies p169
Shock front development in ferrite-loaded coaxial lines with axial bias p237

CALIBRATION

AC QHE-based resistance and capacitance calibrations p190
Calibration of IVDs at frequencies up to 1 MHz by permuting capacitors p193
Comparison between the ripple technique and the direct calibration method for characterisation of directional devices p196
Design and fabrication of a low-cost microengineered silicon pressure sensor with linearised output p127

CAPACITORS

Calibration of IVDs at frequencies up to 1 MHz by permuting capacitors p193

CIRCUIT COMPONENTS

New formula to calculate the skin effect in isolated tubular conductors at low frequencies p169

CODES AND DECODING

Neural network and DSP based decoder for DTMF signals p34

COMMUNICATION SYSTEM THEORY

Real-time VLBI systems using STM-1 and -16 ATM networks p121

COMPUTERISED INSTRUMENTATION

100 A AC-DC current measurements to within ±25 ppm from 3 Hz to 1 kHz p186
Classification of the strain and growth phase of cyanobacteria in potable water using an electronic nose system p158
Virtual instrumentation for clinical assessment of cardiovascular and autonomic function p397

DIELECTRIC MATERIALS AND DEVICES

Dielectric measurements and analysis for the design of conductor/insulator artificial dielectrics p202
Higher-order modes in dielectric resonators for measurement of loss tangent p91
Layered Al_2O_3-TiO_2 composite dielectric resonators with tuneable temperature coefficient for microwave applications p269

DISPLAY TECHNOLOGY

Design and fabrication of a low-cost microengineered silicon pressure sensor with linearised output p127

EARTH SCIENCES

Real-time VLBI systems using STM-1 and -16 ATM networks p121

EDDY CURRENTS

Measurement of microwave properties of magnetic particulate composites p209

ELECTRIC DISCHARGES

Degradation and breakdown of mica under partial discharge stressing p105
Degradation and breakdown of mica under partial discharge stressing: Transverse discharges p256
Degradation of epoxy resin by partial discharges p97
Effects of silicone impregnant viscosity on metallised layer of polypropylene capacitor film under partial discharges [and reply] p95
Electric field breakdown at micrometre separations in air and nitrogen at atmospheric pressure p261
Measurements of current and electric field distributions beneath a positive DC wire-to-plane corona using a linear biased probe p74
Method to determine the trapping level of a polymeric material from thermally stimulated discharge current measurements p2
New investigations of the 'early streamer emission' principle p243
Partial discharge classification using principal component transformation p7
Partial discharge location in power transformers p249
PD detection and localisation by acoustic measurements in an oil-filled transformer p81
Simulation of the coronal development in air at radio frequency: the effects of attachment, secondary emission and diffusion p65
Tests on the breakdown of air at elevated temperatures in non-uniform electric fields p291

ELECTRO-OPTICAL DEVICES

Validation of electro-optic sensors for near-field measurement p165

ELECTROMAGNETIC COMPATIBILITY

Coaxial conductor of high screening capability p27

ELECTROMAGNETIC FIELDS

Interaction of a moving charge and toroidal coil [and reply] p266
Interaction of moving charge and toroidal coil supplied by a constant-current source p15
Maxwell stress dyadic in differential-form formalism p19
Measurement of microwave properties of magnetic particulate composites p209
Modelling of collisions and scattering of particles in electromagnetic fields using TLM p279

ELECTROMAGNETIC INTERFERENCE

Coaxial conductor of high screening capability p27

ELECTROMAGNETISM

Boundary integral computation of electric fields in multielectrode galvanic systems using normally continuous elements p145
Measurement of microwave properties of magnetic particulate composites p209

ENVIRONMENTAL ASPECTS

Classification of the strain and growth phase of cyanobacteria in potable water using an electronic nose system p158
Disinfection of deionised water using AC high voltage p141
Use of fluorimetry in determination of DDB contamination in soils from underground oil-filled power cable leaks p296

INSTRUMENTATION AND MEASUREMENT

100 A AC-DC current measurements to within ±25 ppm from 3 Hz to 1 kHz p186
AC QHE-based resistance and capacitance calibrations p190
Accurate measurement of currents generated by single electrons transported in a one-dimensional channel p174
Calibration of IVDs at frequencies up to 1 MHz by permuting capacitors p193
Comparison between the ripple technique and the direct calibration method for characterisation of directional devices p196
Determination of the pressure coefficients of electronic voltage standards p183
Dielectric measurements and analysis for the design of conductor/insulator artificial dielectrics p202
Electric field breakdown at micrometre separations in air and nitrogen at atmospheric pressure p261
Electromagnetic measurements p173
Ion trajectories in quadrupole mass spectrometer with a static transverse magnetic field applied to mass filter p274
Measurement of microwave properties of magnetic particulate composites p209
Measurements of current and electric field distributions beneath a positive DC wire-to-plane corona using a linear biased probe p74
Using power spectra and Allan variances to characterise the noise of Zener-diode voltage standards p177
Validation of electro-optic sensors for near-field measurement p165

INSULATORS AND INSULATION

Degradation and breakdown of mica under partial discharge stressing p105
Degradation and breakdown of mica under partial discharge stressing: Transverse discharges p256
Degradation of cellulosic insulation in power transformers .4. Effects of ageing on the tensile strength of paper p285
Degradation of cellulosic insulation in power transformers. I. Factors affecting the measurement of the average viscometric degree of polymerisation of new and aged electrical papers p86
Degradation of cellulosic insulation in power transformers. Part 2: formation of furan products in insulating oil p110
Degradation of cellulosic insulation in power transformers. Part 3: effects of oxygen and water on ageing in oil p115
Degradation of epoxy resin by partial discharges p97
Effects of silicone impregnant viscosity on metallised layer of polypropylene capacitor film under partial discharges [and reply] p95
Method to determine the trapping level of a polymeric material from thermally stimulated discharge current measurements p2
PD detection and localisation by acoustic measurements in an oil-filled transformer p81

MAGNETIC MATERIALS AND DEVICES

Magnetic grooved bar-code recognition system with slant MR sensor p131
Measurement of microwave properties of magnetic particulate composites p209

MAGNETIC MEASUREMENT

Magnetic grooved bar-code recognition system with slant MR sensor p131
Measurement of microwave properties of magnetic particulate composites p209

MATERIALS SCIENCE

Degradation of epoxy resin by partial discharges p97
Dielectric measurements and analysis for the design of conductor/insulator artificial dielectrics p202
Layered Al_2O_3-TiO_2 composite dielectric resonators with tuneable temperature coefficient for microwave applications p269
Long term effect of power system unbalance on the corrosion fatigue life expenditure of low pressure turbine blades p229
Measurement of microwave properties of magnetic particulate composites p209

MATHEMATICAL TECHNIQUES

Boundary integral computation of electric fields in multielectrode galvanic systems using normally continuous elements p145
Maxwell stress dyadic in differential-form formalism p19
Quantitative evaluation of techniques for ocular artefact filtering of EEG waveforms p219

MEASUREMENT OF SPECIFIC VARIABLES

100 A AC-DC current measurements to within ±25 ppm from 3 Hz to 1 kHz p186
AC QHE-based resistance and capacitance calibrations p190
Accurate measurement of currents generated by single electrons transported in a one-dimensional channel p174
Classification of the strain and growth phase of cyanobacteria in potable water using an electronic nose system p158
Combined time-of-flight and Doppler ultrasonic tracking system for better performance in robot tracking p213
Degradation and breakdown of mica under partial discharge stressing p105
Degradation of cellulosic insulation in power transformers. I. Factors affecting the measurement of the average viscometric degree of polymerisation of new and aged electrical papers p86
Design and fabrication of a low-cost microengineered silicon pressure sensor with linearised output p127
Determination of the pressure coefficients of electronic voltage standards p183
Dielectric measurements and analysis for the design of conductor/insulator artificial dielectrics p202
Electric field breakdown at micrometre separations in air and nitrogen at atmospheric pressure p261
Higher-order modes in dielectric resonators for measurement of loss tangent p91
Langmuir-Blodgett films of composite calixarene/polyphenylsulphide compounds for ozone sensing p153
Measurement of microwave properties of magnetic particulate composites p209
Measurements of current and electric field distributions beneath a positive DC wire-to-plane corona using a linear biased probe p74
New investigations of the 'early streamer emission' principle p243
Partial discharge location in power transformers p249
PD detection and localisation by acoustic measurements in an oil-filled transformer p81
Use of fluorimetry in determination of DDB contamination in soils from underground oil-filled power cable leaks p296
Using power spectra and Allan variances to characterise the noise of Zener-diode voltage standards p177
Validation of electro-optic sensors for near-field measurement p165
Virtual instrumentation for clinical assessment of cardiovascular and autonomic function p397

MEASUREMENT SCIENCE

AC QHE-based resistance and capacitance calibrations p190
Accurate measurement of currents generated by single electrons transported in a one-dimensional channel p174
Calibration of IVDs at frequencies up to 1 MHz by permuting capacitors p193
Comparison between the ripple technique and the direct calibration method for characterisation of directional devices p196
Determination of the pressure coefficients of electronic voltage standards p183
Electromagnetic measurements p173
Using power spectra and Allan variances to characterise the noise of Zener-diode voltage standards p177

MICROMECHANICAL DEVICE TECHNOLOGY

Design and fabrication of a low-cost microengineered silicon pressure sensor with linearised output p127

MICROPROCESSORS

Design and fabrication of a low-cost microengineered silicon pressure sensor with linearised output p127

MICROWAVE MEASUREMENT TECHNIQUES

Comparison between the ripple technique and the direct calibration method for characterisation of directional devices p196
Higher-order modes in dielectric resonators for measurement of loss tangent p91
Measurement of microwave properties of magnetic particulate composites p209

NEURAL NETWORKS

Automated assessment of vigilance using committees of radial basis function analysers p333
Classification of the strain and growth phase of cyanobacteria in potable water using an electronic nose system p158
Neural network and DSP based decoder for DTMF signals p34
Robust ECG R-R wave detection using evolutionary-programming-based fuzzy inference system (EPFIS), and application to assessing brain-gut interaction p351
Visualisation and categorisation of respiratory mechanism using self organising maps p339

NUMERICAL ANALYSIS

Boundary integral computation of electric fields in multielectrode galvanic systems using normally continuous elements p145
Method to determine the trapping level of a polymeric material from thermally stimulated discharge current measurements p2
New formula to calculate the skin effect in isolated tubular conductors at low frequencies p169
Simulation of the coronal development in air at radio frequency: the effects of attachment, secondary emission and diffusion p65

OPTICAL COMMUNICATION

Real-time VLBI systems using STM-1 and -16 ATM networks p121

OPTICAL IMAGE PROCESSING

Adaptive combination of linear predictors for lossless image compression p414
Classification of the strain and growth phase of cyanobacteria in potable water using an electronic nose system p158
New range-based neighbourhood operator for extracting edge and texture information from mammograms for subsequent image segmentation and analysis p408
Nonlinear analysis of carotid artery echographic images p327

OPTICAL SWITCHING

Real-time VLBI systems using STM-1 and -16 ATM networks p121

OPTICAL TECHNIQUES

Validation of electro-optic sensors for near-field measurement p165

PARAMETER ESTIMATION

Learning interaction dynamics with coupled hidden Markov models p345
Parametric bispectral estimation of EEG signals in different functional states of the brain p374

PATTERN RECOGNITION

New range-based neighbourhood operator for extracting edge and texture information from mammograms for subsequent image segmentation and analysis p408

PLASMA TECHNOLOGY

Tests on the breakdown of air at elevated temperatures in non-uniform electric fields p291

POWER ELECTRONICS

Using power spectra and Allan variances to characterise the noise of Zener-diode voltage standards p177

POWER ENGINEERING COMPUTING

Partial discharge location in power transformers p249

POWER SYSTEM PROTECTION

Long term effect of power system unbalance on the corrosion fatigue life expenditure of low pressure turbine blades p229
New investigations of the 'early streamer emission' principle p243
Novel model for the simulation of lightning stepped leader p56

POWER SYSTEMS AND APPLICATIONS

Disinfection of deionised water using AC high voltage p141

POWER SYSTEMS AND PLANTS

Long term effect of power system unbalance on the corrosion fatigue life expenditure of low pressure turbine blades p229

PRODUCTION ENGINEERING

Degradation and breakdown of mica under partial discharge stressing p105
Degradation of cellulosic insulation in power transformers. Part 2: formation of furan products in insulating oil p110
Degradation of cellulosic insulation in power transformers. Part 3: effects of oxygen and water on ageing in oil p115
Degradation of epoxy resin by partial discharges p97
New-product-development performance evaluation: a product-complexity-based methodology p41

RADIO SYSTEMS

Real-time VLBI systems using STM-1 and -16 ATM networks p121

RELIABILITY

Partial discharge location in power transformers p249

ROBOTICS

Combined time-of-flight and Doppler ultrasonic tracking system for better performance in robot tracking p213

SEMICONDUCTOR DEVICES

Determination of the pressure coefficients of electronic voltage standards p183
Using power spectra and Allan variances to characterise the noise of Zener-diode voltage standards p177

SEMICONDUCTOR MATERIALS

Optical studies on sol-gel derived titanium dioxide films p301

SENSORS AND ACTUATORS

Classification of the strain and growth phase of cyanobacteria in potable water using an electronic nose system p158
Design and fabrication of a low-cost microengineered silicon pressure sensor with linearised output p127
Langmuir-Blodgett films of composite calixarene/polyphenylsulphide compounds for ozone sensing p153
Magnetic grooved bar-code recognition system with slant MR sensor p131
Validation of electro-optic sensors for near-field measurement p165

SIGNAL DETECTION

Effect of cross-correlation on auditory evoked response detection p378
Extreme value statistics for novelty detection in biomedical data processing p363
Novel decision strategy for P-wave detection utilising nonlinearly synthesised ECG components and their enhanced pseudospectral resonances p389
Prospects for routine detection of dementia using the fractal dimension of the human electroencephalogram p321
Robust ECG R-R wave detection using evolutionary-programming-based fuzzy inference system (EPFIS), and application to assessing brain-gut interaction p351

SIGNAL PROCESSING

Aspects of diagnostic schemes for biomedical and engineering systems [EMG, ECG, and diesel engine application] p357
Automated assessment of vigilance using committees of radial basis function analysers p333
Effect of cross-correlation on auditory evoked response detection p378
Extracting single trial event related potentials p382
Extreme value statistics for novelty detection in biomedical data processing p363
Learning interaction dynamics with coupled hidden Markov models p345
Neural network and DSP based decoder for DTMF signals p34
Novel decision strategy for P-wave detection utilising nonlinearly synthesised ECG components and their enhanced pseudospectral resonances p389
Parametric bispectral estimation of EEG signals in different functional states of the brain p374
PD detection and localisation by acoustic measurements in an oil-filled transformer p81
Prospects for routine detection of dementia using the fractal dimension of the human electroencephalogram p321
Quantitative evaluation of techniques for ocular artefact filtering of EEG waveforms p219
Robust ECG R-R wave detection using evolutionary-programming-based fuzzy inference system (EPFIS), and application to assessing brain-gut interaction p351
Robust methodology for the discrimination of brain tumours from in vivo magnetic resonance spectra p309
Time-frequency analysis of short segments of biomedical data p368
Using dynamical embedding to isolate seizure components in the ictal EEG p315
Variability of photoplethysmography peripheral pulse measurements at the ears, thumbs and toes p403
Virtual instrumentation for clinical assessment of cardiovascular and autonomic function p397
Visualisation and categorisation of respiratory mechanism using self organising maps p339

SIMULATION, MODELLING AND IDENTIFICATION

Learning interaction dynamics with coupled hidden Markov models p345

STATISTICAL ANALYSIS

Classification of the strain and growth phase of cyanobacteria in potable water using an electronic nose system p158
Degradation of cellulosic insulation in power transformers .4. Effects of ageing on the tensile strength of paper p285
Extreme value statistics for novelty detection in biomedical data processing p363
Learning interaction dynamics with coupled hidden Markov models p345
New investigations of the 'early streamer emission' principle p243
Parametric bispectral estimation of EEG signals in different functional states of the brain p374
Partial discharge classification using principal component transformation p7
Quantitative evaluation of techniques for ocular artefact filtering of EEG waveforms p219

SWITCHING THEORY

Real-time VLBI systems using STM-1 and -16 ATM networks p121

THIN FILM GROWTH

Surface plasmon resonance studies on spin coated films of azobenzene-substituted calix-4-resorcinarene molecules p137

TRANSFORMERS

Degradation of cellulosic insulation in power transformers .4. Effects of ageing on the tensile strength of paper p285
Degradation of cellulosic insulation in power transformers. I. Factors affecting the measurement of the average viscometric degree of polymerisation of new and aged electrical papers p86
Degradation of cellulosic insulation in power transformers. Part 2: formation of furan products in insulating oil p110
Degradation of cellulosic insulation in power transformers. Part 3: effects of oxygen and water on ageing in oil p115
Interaction of a moving charge and toroidal coil [and reply] p266
Partial discharge location in power transformers p249
PD detection and localisation by acoustic measurements in an oil-filled transformer p81

WAVEGUIDE COMPONENTS

Comparison between the ripple technique and the direct calibration method for characterisation of directional devices p196
Higher-order modes in dielectric resonators for measurement of loss tangent p91
Layered Al_2O_3-TiO_2 composite dielectric resonators with tuneable temperature coefficient for microwave applications p269

WAVEGUIDE THEORY

Higher-order modes in dielectric resonators for measurement of loss tangent p91
Shock front development in ferrite-loaded coaxial lines with axial bias p237

WAVEGUIDES

Shock front development in ferrite-loaded coaxial lines with axial bias p237